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THE DEVELOPMENT AND FIELDING OF A
MAJOR COMPUTER SYSTEM-CASE STUDY OF THE
JOINT UNIFORM MILITARY PAY SYSTEM-ARMY
(JUMPS-ARMY)

J. Claud Wallace, Jr.

Army War College
Carlisle Barracks, Pennsylvania

8 March 1972

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THE DEVELOPMENT AND FIELDING OF
A MAJOR COMPUTER SYSTEM--CASE STUDY
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(JUMPS--ARMY)

A CASE STUDY

by

Lieutenant Colonel J. Claud Wallace, Jr.
Finance

US Army War College
Carlisle Barracks, Pennsylvania
8 March 1972

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This case study addresses the systems aspects of the development and fielding of JUMPS-Army with emphasis on the systems planning, project control, and management techniques and tools used. JUMPS-Army was implemented world wide between July and December 1971. Only enough technical material is included to illustrate the technique being discussed. The author was Project Manager for the system for 14 months and presents the key management concepts from a lessons learned, or this is the way that it was, viewpoint. The study is intended to be helpful to those who work on standard worldwide computer systems. After a brief background description to establish the environment, the control system or master plan is discussed in some detail. The actions taken under early project management are described and relationships with the DA Staff Agencies identified. A total of 13 management techniques are described and illustrated in the study. The two conclusions concern the necessity for a strong, knowledgeable, and dynamic General Officer to serve as the undisputed director of the system and the absolute requirement for a good master plan and control system.

PREFACE

This case study was produced to document experience gained in the fielding of the Joint Uniform Military Pay System of the Army (JUMPS-Army). It is envisioned that this study will assist those who are developing and fielding the other world-wide standard computer systems. No attempt is made to tell the complete story of JUMPS-Army. Examples are included to illustrate the technique which is being discussed. Credit for the techniques and tools described in this study belongs to MG Ralph J. Richards, Jr. His personal time and effort to train the author in the application of management technique is gratefully acknowledged. Most of the material for this study has been taken from the experience of the author as the Project Manager for the system working directly with General Richards. Because JUMPS-Army is classified as a command unique system, the complete capability for fielding the system is organic to the Office, Comptroller of the Army. In contrast, the Computer System Command centrally programs the multi-command systems.

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CHAPTER I

INTRODUCTION

Several of the large scale army computer systems are being designed with centralized programming and control. These systems are in various states of development, design, and testing. The Joint Uniform Military Pay System--Army (hereafter referred to as JUMPS-Army) was the first of these major systems to be successfully fielded. No attempt will be made in this case study to support a conclusion that JUMPS-Army was fielded without problems. There were problems during implementation, and a recent Army Times article quoted Major General Ralph J. Richards, Jr., the Assistant Comptroller of the Army responsible for JUMPS-Army, as stating that some problems exist even after the system has been successfully implemented.¹ In this case study the references to the ACOA, the General, the CG, or General Richards are all referring to Major General Ralph J. Richards, Jr., the Assistant Comptroller of the Army for Finance and Comptroller Information Systems (ACOA, FINCIS).

While there are several very interesting technical areas of JUMPS-Army which could be addressed, this study will concentrate on those systems aspects which could be applicable to any systems effort.

The specific areas covered in this study are systems planning, project control methods, the implementation plan, and management techniques and tools. Only that quantity of technical material considered necessary for the clear and complete presentation and

understanding of the primary material has been included. The brief background of JUMPS-Army will also facilitate identification of basic differences between JUMPS-Army and any other system being considered.

This study was prompted by the fact that little firsthand experience in fielding large scale data processing systems on a world-wide basis exists in the Army. There has also been little practical material written on this subject. Because of this lack of written material the bibliography is very abbreviated. This case study documents a step in systems implementation that is usually omitted either because it was not necessary to the operation of the system, or the people who had detailed knowledge of the facts have moved on to other critical projects which require their full attention.

The material for this case study has been drawn from one or more of the following sources which all fall in the category of personal experience.

First, during the period from August 1967 to April 1970 the author was the Comptroller of the Army Liaison Officer to the Combat Service Support System (CS₃) which was undergoing preparation for prototype testing at Fort Hood, Texas. In order to test the interface of the CS₃ Personnel and Administration system, units at Fort Hood were converted to the centralized pay system that was then under test. The author was responsible for the planning and coordination of this implementation of centralized pay and test of the interface.

Second, in May and June 1969 the author was tasked by the Deputy Comptroller of the Army to conduct a detailed study of the JUMPS-Army ADP hardware systems and programming efforts of the Finance Center US Army at Fort Benjamin Harrison, Indiana. The charter for the study group called for critical analysis, problem identification and recommended specific actions which would lead to early implementation of the system.

And finally, from May 1970 to July 1971 the author was the COA Project Manager for JUMPS-Army. This period is discussed in Chapter IV with emphasis on the actions taken under project manager-ship. This assignment was simultaneously the most rewarding career experience and the most exhaustive hands-on course in management that any officer could hope to have. As covered in the preface, none of the credit for selection or design of management techniques or tools goes to the Project Manager. The prime missions of the Project Manager were; to know all about JUMPS-Army--the status of each project as well as the successes and present or projected problem areas; to keep the ACOA advised of all areas of JUMPS-Army development on a current basis; to brainstorm ideas with the ACOA, develop those with merit, and present alternative courses of action for approval; and to follow the management practices outlined by the ACOA.

Part of the case study is taken from memory of experiences, part from working notes and charts which are available only in the office of the Project Manager, and much is taken from close working relationship and many personal interviews with Major

General Ralph J. Richards, Jr. (ACOA, FINCIS). Unless otherwise specified these sources are credited without repetitive footnotes.

The purpose of this case study is to record some of the lessons learned and the technique used in fielding JUMPS-Army as an aid to present and future staff personnel who are responsible for systems.

CHAPTER I

FOOTNOTES

1. "Ups and Downs of JUMPS," Army Times (9 February 1972),
p. 10.

CHAPTER II

BACKGROUND

The Army began centralizing and computerizing military pay in May 1961 with a limited military pay test at Fort Huachuca, Arizona. The initial tests were successful and in December 1962 the project was moved to the Finance Center US Army at Fort Benjamin Harrison, Indiana, for the purpose of expanding, developing, and further testing centralized pay. Selected units continued to be paid from the Finance Center until JUMPS-Army was implemented, however after a short while there was a pause in learning from the test.

In November 1966 the Assistant Secretary of Defense (Comptroller) directed that the Services develop comparable military pay systems.¹ Each Service was to develop its own "Joint Uniform Military Pay System" or "JUMPS" which would follow general DOD guidelines. Studies prior to the directive had identified approximately 200 pay differences between the Services and 35 of these were statutory, therefore, identical systems were not practical.

The DOD requirement established the following objectives:

1. Adequate service to the military member.
2. Maximum uniformity among the Services.
3. One master military pay account for each active duty member on a computer at a single operating site.
4. Production of comprehensive, accurate, and timely accounting reports for DA, DCSPER.

5. The long range objectives were oriented toward improving the initial product through more efficient use of computers.

The Army specifications for a computer for centralized pay were prepared before the DOD directive for JUMPS and called for a tape oriented system. In December 1967 the Army selected two UNIVAC 494 computers (hereafter referred to as U-494) for JUMPS: one to pay the Army and one for backup. The selection of UNIVAC equipment caused considerable concern within the Finance Center which later proved to be well founded. The initial concern was that the test was running on Honeywell 1800 equipment and the experience was not transferrable to UNIVAC. It was also suspected that the selected equipment could not perform the mission. In June 1969 a DA decision to proceed with the development of JUMPS-Army for the UNIVAC 494 computer was made. This decision was made in the face of some uncertainty that the computer could perform the job. The decision selected the path that offered the earliest chance of fielding an operating system and provided a lengthy period of underutilization of the first computer. This enhanced the programming effort by providing a convenient testbed.

In the final stages of test and debug of the major programs it was found that two U-494s could not pay the entire Army and that it would take three U-494s to process Army pay in the critical six day period. This six day processing period was compressed between two dates. At the front end it was necessary to process changes generated in the field through the 15th of the month in

order to satisfy the primary objective of "adequate service." A study established that over half of the finance offices met the 15th cutoff date before JUMPS-Army. After processing and communications time was allowed, a cutoff date at the computer of the 19th of the month was established. The processing and mail time after computation dictated that the checks and earnings statements be completed by midnight the 24th day of the month. The time between 0100 hours the 19th and 2400 hours the 24th became the critical six day processing cycle. It was also determined that one U-494 could adequately back up three U-494s. Consequently, four U-494s were installed at the prime site in time to accept the large volume of transactions as the Army was converted to JUMPS-Army. The backup determination will be discussed further under management techniques in Chapter V. Also at this time the deadline for Centralized Army pay was established as January 1972, and January 1973 was set as the deadline for including the sophistications required to fully meet the DOD requirements.

JUMPS-Army is classified in the Army Management Information Systems Master Plan (AMIS) as a command unique system under the responsibility of the Comptroller of the Army.

By August 1969 it had become obvious that a new JUMPS Master Plan was required if the many facets of the project were to be tracked and the extremely tight implementation schedule met. This Master Plan is discussed in Chapter III of this case study.

Major General Ralph J. Richards, Jr. was reassigned from the Finance Center to the Office, Comptroller of the Army in May 1970, and JUMPS-Army was placed under Project Management shortly thereafter. JUMPS-Army was chosen for intensive management because it was the only system under development that could cure the serious ailments of the existing pay systems. It was also the only major computer system in the AMIS for which COA was primarily responsible. The actions taken under project management will be discussed later in Chapter IV.

Due to the close connection between events after May 1970 and the control, management techniques, and tools used, I will skeletonize here and provide more details later in the case study:

June 70	The DA Staff was tasked with JUMPS-Army missions.
October 70	A DA decision was made to implement Army-wide by December 1971.
November 70- July 71	All major commands, beginning with USAREUR, were briefed on JUMPS-Army.
July 71	First payday under JUMPS-Army for HQ, DA personnel.
August 71	First payday under JUMPS-Army for CONUS personnel.
October 71	First payday under JUMPS-Army for Europe, Turkey, and Africa personnel.
November 71	First payday under JUMPS-Army for Pacific, Canal Zone, and Alaska personnel.

This selected background information has provided a basis for better understanding the environment of the JUMPS-Army project in the summer of 1970. The following three chapters will expand on

the critical systems areas with emphasis on the period May 1970
to December 1971..

CHAPTER II

FOOTNOTES

1. US Department of Defense, Department of Defense Instruction 7330.4: Requirement for Development, Test, Evaluation, and Installation of the Joint Uniform Military Pay System. (7 November 1966).

CHAPTER III

CONTROL SYSTEM OF JUMPS-ARMY

Before explaining the actual control system used for JUMPS-Army, the relationships of the several organizations will be clarified. The ACOA, FINCIS (who also served as the CG FINCISCOM) had primary responsibility for JUMPS within Office, Comptroller of the Army. The JUMPS-Army Project Manager reported directly to ACOA, FINCIS. The systems staff in the Finance and Comptroller Information Systems Command managed the parts of JUMPS that must be accomplished in Washington. Coordinations within the DA Staff and with DOD are examples of actions taken by this staff. The CG, Finance Center US Army was responsible for the systems design, programming, and operation of JUMPS-Army. He was under command control of ACOA, FINCIS and had a JUMPS-Army systems office (JASO) that worked directly with the Project Manager. The JASO was a project manager organization for the Finance Center.

One of the vital keys to the successful fielding of a major system is a good control system that contains the detail plan and the status as measured against that plan.

The JUMPS-Army Master Plan was in a book three inches thick that contained approximately 350 legal size pages of charts and narrative. It contained the summary data for the 41 major items that will be covered later in this chapter. The details backing up this system were contained in major item books which if placed

in one stack would stand over 8 feet high. Notwithstanding all this detail, the Master Plan was in fact a base for change.

There were six levels in the hierarchy of control which provide ease of classification, assignment of responsibility, allocation of resources, scheduling of work, and the pattern for reporting. These levels were category, major item, project, task, item, and element.

CATEGORY

Six categories were initially used as the first breakdown for identifying the component parts of the project. They were equipment, systems, programming, training, testing and evaluation, and conversion. Later a seventh category titled information was added in order to clearly identify information as distinct from training. This new category covered all the projects pertaining to the written or spoken story of JUMPS-Army. Stated in another way, it covered the public information aspects of the system.

The category breakout provided a step toward grouping of like items and had the effect of reducing the size of the project since the categories could be looked at individually. This breakout also provided an easy identification point for arrangement of status briefings and reports.

MAJOR ITEM

Major items identified the major components or milestones within the category. At this level of the plan a responsible

major item director was identified. This director was responsible for every action identified with that item, for maintaining work on schedule, reviewing accomplishments, and reporting status.

Examples of major items include:

#12 - Install first increment first 494.

#16 - Design JUMPS-Army overall system.

It should be recognized that quite a bit of information about JUMPS-Army existed in August 1969 when master planning was intensified. Testing had begun in 1961 and selected units had been paid under the test system since 1962. By 1969 approximately 100,000 troops in 15 units were paid centrally, still the Master Plan was created to be changed for improvements.

Each major item was assigned a beginning and ending date which clearly depicted its relative position in the project. This time schedule was then subdivided by project and the planned and actual accomplishments plotted on a current basis. This comparison of actual status with planned schedule provided a current picture of the system.

PROJECT

Projects were definable parts of a major item that were broken out for control. Each project described what was accomplished and was assigned to a project leader who was responsible for the successful completion of the project on schedule. At project level a distinction was made concerning whether the action would be a Finance Center or a Non-Finance Center responsibility. The

Non-Finance Center Projects covered those actions that must be taken by members of the DA Staff. This staff involvement will be discussed later in Chapter IV.

TASK, ITEM, ELEMENT

Without going into a lot of detail, suffice it to say that the last three levels of control each provided further breakdown of the project and further identified the specifics of the job to be accomplished. This breakdown was carried to the extent necessary for complete identification.

CONTROLS

The system of organizing work which has just been outlined has proven successful for planning, organizing, and controlling JUMPS-Army. The key factor to the degree of success will be mentioned here but will be discussed in more detail under management techniques. Once the Master Plan was prepared and approved it would be changed only by the ACOA and then only after detailed justification. This restriction included project descriptions, schedules, and even titles. This central control forced all effort to a goal that had been carefully approved and precluded hasty convenient change in the heat of battle.

As a valuable by-product, the system provided for early warning of approaching problems so that preventive action could be taken.

CHAPTER IV

IMPLEMENTATION PLAN

This chapter will concentrate on the implementation plan with emphasis on the approach taken after May 1970 when JUMPS-Army was placed under project managership.

PROJECT REVIEW

The first action of the Project Manager was to determine the current status of the project, whether the present design plans for JUMPS-Army filled the present need, and which areas required decision or resources in order to move on.

As it turned out, the current status became almost insignificant because it was found that major deficiencies existed which required fast decisions and major redesign of the system. During a lengthy test it is natural that related side issues would also be tested. In May 1970 the after effects of some of these tests lingered and required final closeout. The Military Pay Service Center Overseas Areas (MPSCOA) was an example of this type test. For this test the pay files and clerks of the two test Finance Units in Germany had been moved to Fort Harrison. This test had caused the CINCUSAREUR to be against JUMPS-Army even though MPSCOA was not a part of JUMPS-Army.

Other issues were under consideration by various factions, each with their own proposals. The method of cash payment under

JUMPS-Army and the type of implementation plan were examples of this. In the latter case one group favored implementation world-wide by grade and the other favored implementation by geographical area. Each group had their advantages well outlined. These type areas were scheduled for early presentation for decision.

Within 60 days at least five changes with major systems programming impact had been made. These improvements were made in the face of a fast closing implementation date, but were necessary for the quality system that must be fielded. Concurrent with project managership the ACOA emphasized that JUMPS-Army must be a quality system. This emphasis on quality was continued throughout the implementation.

REORGANIZATION

The second major action of the Project Manager was to reorganize the JUMPS-Army effort at HQ, DA. The new organization had groups to address the systems aspects required for January 1972 implementation, the systems aspects required by DOD but to be implemented after January 1972, interface with the personnel system, the information program, and an alternate site. This structure permitted the staff to specialize and concentrate on their area. It also permitted changes in priorities by reallocation of resources.

DA STAFF INVOLVEMENT

The third major action was to prepare program packages for the DA Staff Agencies who were responsible for parts of JUMPS-Army. Packages were prepared for the following agencies and covered the areas indicated.

Assistant Chief of Staff, Communications and Electronics

ACSC-E was responsible for having adequate world-wide communications for JUMPS data to be moved by AUTODIN. Although general assurances had been made earlier that there would be adequate AUTODIN capability, it was not until after terminal locations, data volumes, and peak period times of transmission were provided to ACSC-E that a formal plan to install communications was made. In October 1970 a world-wide conference was called to get a fix on current and projected communications requirements. ACSC-E did an outstanding job of providing AUTODIN, however, the project was closely monitored through the Master Plan. LTG John M. Wright, Jr., the COA, during a briefing on JUMPS, summed up the need for monitorship when he said, "I am responsible to the Chief of Staff for JUMPS and if General Picket (ACSC-E) fails, then I fail." This close monitorship was applied to each part of JUMPS-Army.

Assistant Chief of Staff, Force Development

ACSFOR was responsible for revision to the staffing of field finance offices. Due to the major changes in procedures, forms, functions, and responsibilities under JUMPS-Army, a new staffing guide was planned to be published after six months of operating experience was obtained. This six month period was planned to provide time for shakedown to determine the best way to accomplish the job. To assist in this the finance office at 2nd and R Streets S. E., Washington, was made into a model office to test operating procedures.

Assistant Chief of Staff, Intelligence

ACSI advised through his agencies concerning the security of the computer site. He also participated directly in the JUMPS-Army systems design wherever controls over records of intelligence personnel was concerned.

Chief of Information

CINFO prepared the information program for those publications which he controls and advised on the remainder of the program.

Deputy Chief of Staff, Personnel

DCSPER coordinated and approved the training plan which placed all training under the supervision of the Army Finance School. DCSPER was also responsible for stabilizing key personnel during

critical periods and for review of the enlisted finance MOS structure. As the program director for the Military Pay Army appropriation, DCSPER provided his complete requirement for data from JUMPS-Army.

Chief of Engineers

Chief of Engineer actions include installation of generators for alternate power and the acquisition of an alternate site for continuity of operations.

Director of Management Information Systems, OAVCS

DMIS was responsible for obtaining approval of all equipment and for equipment performance reviews.

All DA Staff responsibility was identified in Chief of Staff Memorandum 70-387.¹

PLANNING

Project Managership was the selected method for providing intensive management to JUMPS-Army. The implementation plan called for the entire Army to be paid by JUMPS-Army by January 1972. The Master Plan described in Chapter III provided the structure that permitted control of the many activities and areas of JUMPS-Army. All of the techniques and tools discussed in Chapter V aided in the constant review, evaluation, and adjustment efforts required to keep the system on schedule. The implementation plan was completed in a timely manner notwithstanding the significant changes that have been mentioned here.

CHAPTER IV

FOOTNOTES

1. US Department of the Army, Chief of Staff Memorandum 70-387: Development, Test, Evaluation, and Installation of the Joint Uniform Military Pay System--Army (JUMPS-Army) (29 October 1970).

CHAPTER V

MANAGEMENT TECHNIQUES AND TOOLS

In 1966 DOD directed a Joint Uniform Military Pay System for the four Services. No matter what prompted the directive, a desire for more standard practices within DOD was ample incentive for retaining interest at that level. There was no incentive of this type for senior Army personnel. In fact most senior Army personnel were convinced that there was nothing wrong with the old pay system. The facts in recent audit reports indicate that the members of the Army had been overpaid in excess of \$200 million a year. It was conservatively estimated that JUMPS-Army would correct 80 per cent of the errors. This \$160 million saving was sufficient to justify the cost effectiveness of JUMPS-Army.

PERSONAL IDENTIFICATION

The single most important factor in the successful development and fielding of JUMPS-Army was the personal identification with and dedication to JUMPS-Army by LTG John M. Wright, Jr., COA and MG Ralph J. Richards, Jr., ACOA, FINCIS. No matter how successful the technique or tool, it must be understood that the personal attention at the general officer level was vital to the fielding of this major computer system.

The remainder of this chapter will discuss management techniques and tools used in the JUMPS-Army program. Specific data is

used only to reinforce the technique used and therefore does not completely document the JUMPS-Army system.

LABELING

As pointed out earlier, there was little high level support for a new pay system before 1969. It was considered vital that the entire Army accept JUMPS-Army as the Army's pay system. Care was taken throughout the implementation phase to keep the system from being thought of as the Comptroller Pay System or the Finance Corps Pay System. Use of command correspondence was a principal tool in accomplishing this objective.

FLEXIBILITY

Design freezes are frequently discussed in the final stages of major systems. Not only was a freeze not possible, but major changes had to be addressed during the critical conversion period when for example, the national price and wage freeze was announced. Flexibility means the ability to change plans whenever the situation warrants change. Obsolescence during development is avoided by being flexible. The Master Plan as discussed in Chapter III provided the basis for controlled flexibility.

INVOLVEMENT

In addition to labeling JUMPS-Army, "the Army's pay system," early action was taken to involve the DA Staff by identifying the responsibilities of each agency in a Chief of Staff Memorandum (CSM).

Specific memoranda outlining the scope of the tasks to be performed, the time frame in which they must be completed, and a point of contact was provided each agency. This last act converted an assignment document into an action document. The details of this technique were discussed in Chapter IV.

BRIEFINGS--INFORMATION

During the long test period several of the shortcomings of the tested system became identified with JUMPS-Army and caused some commanders to be against the system. The dislike for MPSCOA by the CINCUSAREUR mentioned in Chapter IV was a classical example. After several exchanges of letters, it was decided that a briefing team would go to Germany to brief on JUMPS-Army, identify problems, and present solutions to the problems. The team consisted of:

MG (then BG) Ralph J. Richards, Jr., ACOA, FINCIS, LTC J. Claud Wallace, JUMPS-Army Project Manager, and COL James I. Stringer, Director of Quality, FCUSA.

The team presented briefings in Germany for every major command and to all Finance Section Commanders. The method of operation was for the Project Manager to brief and then the ACOA would field questions with team backup. In addition to briefing, the team visited 9 out of 21 Finance Offices in Germany and discussed problem areas with the key staff members.

After being assured that MPSCOA would not be implemented with JUMPS-Army, General Polk, CINCUSAREUR, smiled and said, "You have

come a long way in the past few months. I'll support JUMPS-Army." Working with his staff a plan for implementing JUMPS-Army was prepared before the team left.

Based on the lessons learned in Europe, the same briefing team visited and briefed in every major command and installation around the world. Each briefing addressed the specific command and problems of that command as they were known to the team.

The following illustrates the tailoring of these briefings. One major command called in February 1970 and asked for someone to come talk to them about JUMPS. General Richards offered the briefing for three days hence and it was accepted. An immediate conference was held to determine what had prompted the call--what was the undefined problem? Since the first letters on consolidation of small offices in metropolitan areas had just been issued, it was decided that this must be the problem. The Command was apparently prepared to oppose consolidation. That night the briefing was modified to identify the small offices of this Command, the number of people that would require training, and the cost of training them. The closing sentence of that part of the briefing identified the cost as a needless expenditure of command monies. The net result was a fine question period, no problems raised, and full support for JUMPS-Army to include consolidation. In fact that Command made an outstanding showing in this area.

Two things were obvious throughout the 137 briefings to over 11,000 people, including 130 general officers. First, it was necessary to have a knowledgeable general officer on the team in

order to get the audience of major commanders (general officers) in the field. Many favorable comments were made concerning the fact that a general officer fielded every question with complete answers; and second, at each stop the team learned more about JUMPS-Army. Each set of questions were different depending on the problems of the audiences. After each stop the Project Manager contacted Washington with instructions for changes. At this point the ADP system was pretty solid and most of the changes were to clarify procedures to be published shortly.

In each command the JUMPS-Army Project Officer accompanied the team and received an intensive, day and night, orientation and training course on JUMPS-Army as it applied to his area of responsibility. When problem areas were found, it was usually sufficient to uncover them and be sure the project officer was aware of them.

WRITTEN INFORMATION

Many articles, fact sheets and stories were written about JUMPS-Army. At the beginning of the information program each audience was identified and the material that was to be aimed at that target audience selected. Every potential medium that could be used as a delivery vehicle was analyzed to determine its distribution and reading audience. Then the delivery systems were selected to carry specially prepared messages to the target audiences. Three of the specialized information vehicles will be described here:

JUMPS-Army Booklet

It was determined that a cartoon book approach would be best for reaching the soldier. After the possibilities had been checked, it was decided to use PS Magazine as a model. After clearance from HQ, AMC to use Connie and her friends as characters, a contract was let with the author of the PS Magazine to design a 16-page, four-color booklet on JUMPS-Army. In order to provide wide coverage, an order for 300,000 copies was placed. This booklet was worth every cent spent on it.

Movie

A 23-minute color movie to explain the pay option form and the leave and earnings statement was commercially produced. This film was introduced by LTG Wright, COA and used professional actors for the JUMPS-Army story. The film was distributed through training channels as a training film.

Briefing Kit

A briefing kit for unit commanders containing prepared briefings and references to other material was distributed through command channels under TAG letter. This kit prepared commanders and first sergeants to accomplish their role of first line responsibility for welfare of their troops. Field finance officers were available and ready to orient troops, but the clear responsibility was on the commander.

BRAINSTORMING

As systems develop and more is known about them by more people it is very important that a good update program be in effect. The update program for JUMPS-Army was fed by a technique called "brainstorming." One afternoon each week the technical people at HQ, DA sat down around the table and talked about some phase of JUMPS-Army. The key JUMPS-Army people at the Finance Center did the same thing. The purpose of the session was to find out what area needed more attention or had simply not been covered to date. About once a month the key DA and the key Finance Center people met for a full day of brainstorming. This session was usually attended by both Commanding Generals. As a variation on the technique, Finance Officers and key NCOs in the Washington area Finance Offices were invited to an all day session with the DA JUMPS-Army staff. They were given about an hour of background briefing on JUMPS-Army and then asked to speak out, challenge, suggest, and ask questions to help make a better system.

Without exception, these sessions produced results. For example, at one joint DA and Finance Center meeting a question was asked about publication of the procedures manual. Before this subject was completed, the question had been expanded to include all publications and it had been determined that there was a serious scheduling problem which required immediate reallocation of resources and requests for special processing by TAGO. The required decisions were made on the spot so that no more time was lost.

REVIEW

Project accomplishments for the week (Monday to Friday) were reported in an unstructured format by the close of business the following Wednesday. These Highlight Reports were read and commented on by the ACOA and returned to the author Thursday morning. The standard against which progress was measured was the Master Plan outlined in Chapter III. In this manner the ACOA was always current without a steady stream of briefers. A weekly report of major events and a detailed quarterly status briefing was given to the COA. This status briefing usually lasted three hours and covered the status of every active project as well as projected plans for the next quarter.

COORDINATION

The formal process for coordination of actions is complicated and sometimes takes weeks to be accomplished. When a system begins to mature, there simply is not time available for the technical people to sit and wait for a paper to run the cycle. Time is particularly critical if the action involves DOD, GAO, or Department of Treasury. A coordination procedure was used for JUMPS-Army which provided for very effective use of time. Two illustrations will outline the process.

Department of Defense

When the systems changes referenced in Chapter IV were being studied, it was recognized that several of them were deviations from planned actions previously reported to OSD. After appropriate briefing and approval within DA, the ACOA and his Project Manager met across the table with the DOD personnel responsible for JUMPS, explained what was planned, obtained concurrence, and prepared and coordinated a memo for the record. Depending on the item, it was either agreed to restate plans in the next Army report, or in one instance OSD agreed to unilaterally modify their directive.

Treasury Department

The final decision to use treasury checks as the pay voucher for cash payments depended upon agreement to the procedures by Treasury Department. The Project Manager met with the Assistant Treasurer of the US to explain what the Army was doing and the advantages of the proposed procedures. Oral agreement on the major points was reached and documented in a memo for the record. A copy of the memo was provided to the Assistant Treasurer. Formal letters covering some of the points were exchanged later, however the new check format was approved right on the requisition.

Face-to-face coordination and discussion within the DA Staff was continuous. The formal vehicle for this coordination was a JUMPS-Army planning group which was chaired by the Project Manager and had membership from the interested staff agencies. Full meetings

were used to update the staff on the status of JUMPS-Army and to discuss subjects of general interest. Most of the work by the group was accomplished in bilateral meetings.

SPECIFIC PROCEDURES AND ORGANIZATION

Late in the development phase of JUMPS-Army, after several field briefing trips, it began to appear that the field procedures and possibly even the organization would have to be prescribed from DA. After much study it was concluded that standard procedures and organizations are a natural by-product of a centrally controlled system.

It was also concluded that many of the shortcomings of previous systems were in fact the failure of field units to follow prescribed procedures or to organize effectively. No matter what the reason for the deviation the result was still failure to accomplish the mission. The urgent requirement for high quality data in the file dictated that efficiency be maintained in the field as well as at the Finance Center. As a result HQ, DA undertook development and testing of standard field organizations, procedures, and equipment for military pay units.

During the later field briefing trips, the model office idea that was developing at DA was described to the key finance personnel. Their immediate response was complete rejection, but after discussion in which they could not find a major fault with the model, they would start to come around. In two cases the new model office plan was implemented before JUMPS with success.

The model plan was simple and addressed workload control and accuracy. The plan basically changed the work measurement factor from number of records to transactions, called for alphabetical files so that anyone can work on any transaction, controlled all work, recorded workload, measured backlog, and required quality assurance checks on all transactions.

STATISTICS AND MATHEMATICS

To the maximum extent possible, proposals involving resources were supported by statistical or mathematical analysis to provide a sound economical basis for decision. The case for additional computers discussed in Chapter II was finally presented in terms of probability analysis. Extensive timing studies using actual programs, the JUMPS-Army equipment configuration, and large volumes of transactions provided evidence that it would take three U-494 computers to pay the entire Army. The problem was initially stated as "How many computers will it take to back up those three computers and provide very high probability that the Army pay could be processed in the critical six day cycle." This question was restated and given concurrently to UNIVAC Corporation and the US Army Computer Systems Support and Evaluation Command. The restatement of the problem asked for the probability that one, two, or three out of three computers would be inoperative for 50 or more hours during the critical six day period. This evaluation was, of course, to be based on experience with like equipment at other installations as well as all other available techniques. The final answer was that probability

of failure of 1 out of 3 computers was moderate to high; of 2 out of 3 in the same time frame was relatively small; and of 3 out of 3 in the same time frame was virtually nonexistent. Consequently, the accepted solution was that 1 U-494 can back up 3 U-494's and provide very high probability that payday will be met.

TRAINING

As mentioned earlier, the responsibility for supervision of all training was assigned to the US Army Finance School by DCSPER. All military pay personnel then in the field or later assigned to the field required training in JUMPS-Army procedures before conversion. The Finance School, working with the Finance Center and DA Staff personnel, prepared courses of instruction for supervisors and clerks, and began teaching JUMPS-Army to resident classes that would be graduated after May 1971.

Major commands were tasked by DA to provide officer and non-commissioned officer personnel to be trained as instructors at the Finance and AG Schools. These three-man instructor teams then trained the supervisors and clerks either at their home station or at a nearby location. It was recognized that funding for TDY travel of the instructors could be a problem, so DA funds for this purpose were made available to the Finance School. During the training at the Finance and AG Schools and while instructing in the field, the instructors reported to the Commandant of the Finance School. After training was completed, they reverted to the Command from which they

had me. A nonresident course was prepared to assist the field in accomplishing refresher training.

PUBLICATIONS

The plan called for a gradual and deliberate buildup of information so that the whole Army would be at the peak of interest when the conversion to JUMPS-Army was to be made. A dilemma is reached when the programmers are still working on the programs and the field offices are preparing the basic input data during the same time frame. How do you tell the field the details of a program that has not been completed with assurance that you are correct? Some of the publications used for JUMPS-Army will be discussed here to illustrate the approach taken to reduce the dilemma.

DA Letters

The fastest way to cover limited problem areas was by DA Letter. For example, early in the implementation phase it appeared that inadequate key punch capability had been allocated to field finance offices for preparation of input data. Major and Subordinate Commanders were asked by DA Letter¹ to survey the situation and insure that the required equipment and resources were made available.

Army Regulations

The original plan for JUMPS-Army identified Army Regulations as the vehicle for all implementing procedures. The initial Army Regulation² was published in January 1971 to identify the responsibilities of the participants in the project. This AR provided the

basis for later actions and was a valuable foundation on which to build a system.

As the dilemma of information availability as opposed to field need for detail procedures grew, it was found that TAGO could not print ARs by the required date based on the revised availability date of the material to be published. At this point the DA Circular was selected as an acceptable alternate.

DA Pamphlet

In February 1971 the program to familiarize commanders and their staffs at all levels with JUMPS-Army was initiated by issuance of DA Pamphlet 37-12.³ This pamphlet covered the objectives, background, and general description of JUMPS-Army. This gradual release of information was effective in building interest even though it prompted many inquiries from the field. These inquiries were answered with an assurance that complete directions would be published in time for them to prepare for conversion.

DA Circulars

Conversion procedures were published in March 1971,⁴ and operating procedures were published in April 1971.⁵ The DA Circular format was used because TAGO could guarantee delivery in 30 days after copy was provided. This project had high priority and received special handling. These two circulars were required for initiation of training. This material was to be updated and put in AR form before the circulars expired.

CHAPTER V

FOOTNOTES

1. US Department of the Army, Letter AGDA(M) (24 Dec 70), FCISC-DDF, Key Punch Capability in Support of JUMPS-Army, 30 December 1970.

2. US Department of the Army, Army Regulation 37-46: Joint Uniform Military Pay System--Army (JUMPS-Army) (19 January 1971).

3. US Department of the Army, Department of the Army Pamphlet 37-12: JUMPS-Army A Military Pay System Automated at a Central Site (2 February 1971).

4. US Department of the Army, Department of the Army Circular 37-64: JUMPS-Army Conversion Procedures (1 March 1971).

5. US Department of the Army, Department of the Army Circular 37-66: JUMPS-Army Operating Procedures (15 April 1971).

CHAPTER VI

CONCLUSIONS

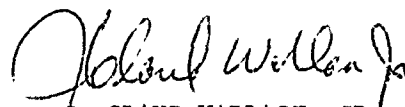
This case study has covered the systems aspects of the development and fielding of a major world-wide computer system. All of the problem areas that are normally present with this type and scale of effort were potentially there. The controls, management techniques, and tools that have been presented here were successful in reducing the problems to a level where successful implementation was accomplished.

While all of the areas discussed were important in the successful fielding of the system, the strong central control by one individual and the detailed Master Plan stand out for special emphasis.

It is concluded that the critical ingredient in the timely fielding of a high quality system was the dynamic personal leadership of Major General Ralph J. Richards, Jr. He openly placed his professional reputation behind each part of the system, maintained a high state of individual knowledge of the system, and personally answered the penetrating questions of major commanders and senior military personnel all over the world. He then effectively used selected management techniques to produce the results. All of the personnel working directly on the system were under the General. This permitted enforcement of directed changes without involving other commanders. It was easy to identify the single individual who was responsible for JUMPS-Army after May 1970.

The complete detailed Master Plan was the principal tool used to plan and track the execution of the plan. The JUMPS-Army Master Plan discussed in Chapter III provided the basis for executive actions by identifying problem areas that required attention. It also provided the capability for monitoring all established components of the system without losing any of the pieces.

Each of the techniques and tools discussed in Chapter V were specially adapted to JUMPS-Army, however, the principal involved in each of them should apply to any major systems effort. Although other techniques may work as well, these did produce success in fielding JUMPS-Army.



J. CLAUD WALLACE, JR.
Lieutenant Colonel, Finance

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2. "Ups and Downs of JUMPS." Army Times, Vol. 32, 9 February 1972, p. 10.
3. US Department of the Army. Army Regulation 37-46: Joint Uniform Military Pay System--Army (JUMPS-Army). Washington: 19 January 1971.
4. US Department of the Army. Chief of Staff Memorandum 70-387: Development, Test, Evaluation, and Installation of the Joint Uniform Military Pay System--Army (JUMPS-Army). Washington: 29 October 1970.
5. US Department of the Army. Department of the Army Circular 37-64: JUMPS-Army Conversion Procedures. Washington: 1 March 1971.
6. US Department of the Army. Department of the Army Circular 37-66: JUMPS-Army Operating Procedures. Washington: 15 April 1971.
7. US Department of the Army. Department of the Army Letter AGDA(M) (24 Dec 70) FCISC-DDF: Key Punch Capability in Support of JUMPS-Army. Washington: 30 December 1970.
8. US Department of the Army. Department of the Army Pamphlet 37-12: JUMPS-Army, A Military Pay System Automated at a Central Site. Washington: 2 February 1971.
9. US Department of Defense. Department of Defense Instruction 7330.4: Requirements for Development, Test, Evaluation, and Installation of the Joint Uniform Military Pay System. Washington: 7 November 1966.